

CLAIMS

1. A source modulation system for use in optical data transmission systems and optical data test components, comprising:

5 a plurality of laser source channels each including a laser source card having a laser source;

 a modulation controller including a plurality of function generators that are each capable of generating waveforms for use at the laser source channels; and

10 a signal pathway connecting the modulation controller with each of the laser source channels.

2. The source modulation system of claim 1, wherein the signal pathway comprises a number of rail lines connecting the modulation controller with each of the laser source cards, the number of rail lines having one-to one correspondence with the function generators on the laser source cards.

15 3. The source modulation system of claim 2, wherein the laser source channels include a programmably controllable rail selection switch for use in switching between selected rail lines to provide a selected laser source drive input corresponding to a selected rail line.

20 4. The source modulation system of claim 3, wherein the modulation controller includes

 a number of waveform input connectors allocated to selected ones of the rail lines, each waveform input connector being capable of receiving waveform input from an external function generator when an external function generator is

connected to the waveform input connector and providing the waveform input as output comprising an external waveform output, and

a corresponding number of programmably configurable waveform selection switches capable of selecting inputs between the corresponding function generator output and the external waveform output, each of the corresponding number of switches being allocated to one of the selected ones of the rail lines.

5. The source modulation system of claim 3, wherein rail system includes a coherence rail system in communication with each of the laser source cards, the coherence rail system including

a coherence control function generator capable of generating a coherence control waveform output and

a programmably controllable coherence rail switch capable of selecting between the coherence control waveform output and a ground.

15. 6. The source modulation system of claim 5, wherein the programmably controllable rail selection switch in each laser source card is capable of selecting between the coherence rail system and the shared rail systems to provide drive input for the laser source.

7. The source modulation system of claim 3, wherein the modulation controller includes a digital modulation rail system including a digital waveform output and

a programmably controllable digital modulation switch capable of selecting between the coherence control waveform output and a ground.

8. The source modulation system of claim 7, wherein each laser source card includes a second switch capable of selecting between the digital modulation rail system and ground.
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9. The source modulation system of claim 8, wherein the laser source card includes a gain block for adjusting the amplitude of waveforms from the shared rail system and the second switch provides a bypass of the gain block.

10. The source modulation system of claim 2, wherein the function generators are operable to produce on the number of rail lines waveforms selected to include at least two members of the group consisting of square waves, sawtooth waves, and sine waves.
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11. The source modulation system of claim 1, wherein the laser source cards contain a programmably configurable switch for use in accepting a
15 selected one of the waveforms as drive input for the laser source.

12. The source modulation system of claim 11, wherein the laser source card includes a gain block that is programmably configurable to adjust an amplitude of the waveform from the selected rail line.

13. The source modulation system of claim 12, wherein the gain block
20 operates by attenuating the amplitude of the waveform.

14. The source modulation system of claim 12, wherein the laser source card includes a bypass mechanism that is programmably configurable to bypass the gain block.

15. The source modulation system of claim 1, comprising a mechanism for accepting external sources to drive modulation input for each of the laser source channels.

16. The source modulation system of claim 15, wherein the mechanism 5 comprises signal input connectors having a one-to one relationship with the number of channels.

17. A method of modulating a source array in an optical source bank including a modulation controller that provides a plurality of waveform outputs to a rail system and a laser source card, the method comprising the steps of:

10 switching the laser source card between selected rails to accept a waveform output from the selected rail for use as laser source drive input.